IN THE CLAIMS:

Please cancel claims 25, 26, and 32-37 without prejudice.

1. (Previously Presented) An in-situ deposition and doping method for a polycrystalline silicon layer of a semiconductor device, said method comprising the steps of:

growing, in a deposition chamber, a first intermediate layer of in-situ doped polycrystalline silicon with a first thickness and a first doping level;

after growing the first intermediate layer, purging the deposition chamber by stopping all gas flow into the chamber and pumping residual gas out of the chamber, so as to remove all available dopant; and

after purging the deposition chamber, growing a second additional layer of polycrystalline silicon with a second thickness and a second doping level that is lower than the first doping level,

wherein the first thickness is greater than the second thickness.

2. (Original) The in-situ deposition and doping method as defined in claim 1, wherein the second doping level is substantially lower than the first doping level.

3. (Original) The in-situ deposition and doping method as defined in claim 1, wherein the first intermediate layer and the second additional layer are of the same conductivity type.

4. (Original) The in-situ deposition and doping method as defined in claim 1, wherein both the first intermediate layer and the second additional layer have n-type conductivity.

5. (Canceled)

6. (Original) The in-situ deposition and doping method as defined in claim 1, wherein in the step of growing a first intermediate layer, a layer of polycrystalline silicon is produced with a thickness that is substantially at a 10:1 ratio with the thickness of the layer of polycrystalline silicon produced in the step of growing a second additional layer.

7. (Previously Presented) The in-situ deposition and doping method as defined in claim 1, further comprising the step of:

performing a subsequent thermal treatment to diffuse dopant from the first intermediate layer to the second additional layer,

wherein the average doping level of the first intermediate layer after the thermal treatment is at least about 1×10^{19} atoms/cm^3.

8. (Original) The in-situ deposition and doping method as defined in claim 1, wherein the step of growing a first intermediate layer is performed through an LPCVD process using a mixture of silane, hydrogen, and phosphine.

9. (Original) The in-situ deposition and doping method as defined in claim 8, wherein the step of growing a second additional layer is performed through an LPCVD process using a mixture of silane and hydrogen.

10. (Original) The in-situ deposition and doping method as defined in claim 1, wherein the second additional layer is substantially not doped.

11. (Previously Presented) The in-situ deposition and doping method as defined in claim 10, further comprising the step of:

performing a subsequent thermal treatment to diffuse dopant from the first intermediate layer to the second additional layer,

wherein the average doping level of the first intermediate layer after the thermal treatment is at least about 1×10^{19} atoms/cm^3.

12. (Previously Presented) The in-situ deposition and doping method as defined in claim 10, further comprising the step of:

performing a subsequent re-oxidation treatment to diffuse dopant from the first intermediate layer to the second additional layer,

wherein the average doping level of the first intermediate layer after the re-oxidation treatment is at least about 1×10^{19} atoms/cm^3.

13. (Original) The in-situ deposition and doping method as defined in claim 12, wherein the step of performing a subsequent re-oxidation treatment includes the sub-steps of:

performing a first thermal treatment in a non-oxidating environment to anneal generated defects; and

performing an oxidation treatment.

14. (Original) The in-situ deposition and doping method as defined in claim 10,

wherein the step of growing a first intermediate layer is performed through an LPCVD process using a mixture of silane, hydrogen, and phosphine, and

the step of growing a second additional layer is performed through an LPCVD process using a mixture of silane and hydrogen.

15. (Previously Presented) An in-situ deposition and doping method for a polycrystalline silicon layer of a semiconductor device, said method comprising the steps of:

growing, in a deposition chamber, a first intermediate layer of in-situ doped polycrystalline silicon with a first thickness and a first doping level;

after growing the first intermediate layer, purging the deposition chamber by stopping all gas flow into the chamber and pumping residual gas out of the chamber, so as to remove all available dopant;

after purging the deposition chamber, growing a second additional layer of polycrystalline silicon with a second thickness; and

performing a re-oxidation thermal treatment to diffuse dopant from the first intermediate layer to the second additional layer,

wherein the second additional layer is substantially not doped, and

the first thickness is greater than the second thickness.

16. (Original) The in-situ deposition and doping method as defined in claim 15, wherein the step of performing a re-oxidation thermal treatment includes the sub-steps of:

performing a first thermal treatment in a non-oxidating environment to anneal defects; and

performing an oxidation treatment.

17-26. (Canceled)

27. (Previously Presented) The in-situ deposition and doping method as defined in claim 1, wherein the polycrystalline silicon layer of the semiconductor device consists of only the first intermediate layer and the overlying thinner second additional layer that provides a barrier during any subsequent thermal treatment.

28-37. (Canceled)

38. (Previously Presented) The in-situ deposition and doping method as defined in claim 1, wherein in the step of growing the second additional layer of polycrystalline silicon, the second additional layer of polycrystalline silicon is grown on the first intermediate layer of in-situ doped polycrystalline silicon.